Abstracts

Ka-Band Microstrip Integrated Circuit FMCW Transceiver

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A high performance Ka-band millimeter-wave integrated circuit FMCW transceiver has been developed. The transceiver consists of a voltage-controlled microstrip Gunn oscillator (Gunn VCO), a 10 dB coupler, a circulator, a single-balanced mixer, a low pass filter and a single-stage IF amplifier. Both packaged and beamlead varactor diodes for the Gunn VCO were evaluated. The entire RF circuit is printed on a single ferrite substrate using thin film microstrip IC technology and integrated into a small module. The transceiver produces more than 20 dBm CW output power via a coaxial connector at 35 GHz for tuning bandwidth exceeding 1 GHz. The RF-to-IF gain is at least 23 dB using a monolithic IF preamplifier, and the SSB noise figure is better than 12 dB. The unit is hermetically shielded in a 1.2 x 1.5 x 0.375 inch (3 x 3.8 x 0.95 cm) enclosure.

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